

**CITGO Petroleum Corporation
Lemont Refinery
Hydrocarbon Flaring Incident Summary – 10/23-24/2013
RCA Completed 12/02/2013**

Incident Number: LE-HC-04-2013-102313

Brief Description of Incident

At approximately 8:37 p.m. on October 23, 2013, flaring began at 844C-2 when multiple refinery process units underwent an emergency shutdown and depressurization. This shutdown was necessitated by a fire in the Crude Unit.

On Wednesday 10/23/2013 a contractor crew was in the process of removing the vacuum tower bottoms pump 11G-9A discharge check valve and spool piece in order to install a 10" bleeder blind to complete the isolation of 11G-9A pump for removal. At approximately 7:40 p.m., while removing the last bolt on the flange, a leak occurred creating a loss of primary containment. The work crew was ordered to evacuate from the worksite. CITGO Crude Unit Operating personnel made an emergency call at approximately 7:40 pm for a potential fire and began applying water to the source of the leak.

The CITGO Fire Department arrived at the scene and began flowing supplemental water on the leak source. The CITGO Fire Department in conjunction with Crude Unit Operating Personnel began to develop a plan to isolate the leak. As plans to isolate the leak source were being implemented the material ignited causing a fire in the area of the 11D-2 Vacuum Tower resulting in a complete unit shutdown. The conditional all clear was given by the CITGO Field Incident Commander at approximately 11:03 pm.

At about the time the notifications were made about the potential fire, operators began reducing rates and shutting down the crude unit and units that depended upon the crude unit for feed (light straight run hydrotreater, diesel and distillate hydrotreaters, naphtha hydrotreater, reformer, and coker). By 8:40 p.m. feed to most of these units had stopped and the units were being depressured to minimize risk, resulting in flaring at the C-3 flare.

The flaring due to the emergency depressurization occurred in two stages – a period of continuous flaring from 8:37 p.m. until 11:38 p.m., and then intermittent flaring from 11:42 p.m. until 1:28 a.m. on October 24, 2013.

C-3 –flaring with more than 500 lbs SO₂ in 24-hrs

Incident Start Date:	10/23/2013	Incident Start Time:	20:37
Incident End Date:	10/24/2013	Incident End Time:	01:28
Estimated SO₂ Emissions:		3.0 tons	Estimated SO₂ Emission Rate: 1,256.3 lbs/hr

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Calculations per Paragraph 92

C-2 flaring

Tons of SO₂ Emitted = [FR][TD][ConcH₂S][8.44 x 10⁻⁵]

= [89,887.4 SCFH] [4.85 hrs] [0.0827 scf H₂S/scf gas] [8.44 x 10⁻⁵] = 3.0 Tons

Rate of SO₂ emissions in lbs/hr = [FR][ConcH₂S][0.169]

= [89,887.4 SCFH] [0.0827 scf H₂S/scf gas] [0.169] = 1,256.3 lbs of SO₂/hr

Meanings of variables and derivation of multipliers used in the above equations are as listed in paragraph 92.c. of the Consent Decree

Steps taken to limit the duration and/or quantity of sulfur dioxide emissions

Fire department personnel responded to the fire. Unit emergency shutdown procedures were implemented.

Root Cause and significant contributing cause(s)

Root-cause:

1. Systems to verify that the pump was truly isolated did not provide a true indication.

[The detailed investigation of this event is still on-going. Additional root causes may be identified.]

Measures to prevent a recurrence of a similar event and proposed corrective actions

1. Review/modify piping on vacuum tower bottoms pumps to be able to confirm/verify zero pressure/isolation.

Action Commencement and Completion Dates

Action	Commencement Dates [mm/yr]	Target Completion Date [mm/yr]	Completion Dates [mm/yr]
1. Review/modify piping on vacuum tower bottoms pumps to be able to confirm/verify zero pressure/isolation.	11/2013	01/2014	

Stipulated penalty determination statement

The stipulated penalty determination statement is not required for the Hydrocarbon Flaring Incident that occurred on 10/23/2013.